

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Bohn et al.

Serial No. 09/077,194

Filed: December 4, 1998

Attorney Docket No.: 02-40045-US

USE OF 1-HYDROXY-2-PYRIDONES  
FOR THE TREATMENT OF  
SEBORRHEIC DERMATITIS

DECLARATION OF MITCHELL S. WORTZMAN, Ph.D.

I, Mitchell S. Wortzman, hereby declare as follows:

1. I am the Executive Vice President, Research and Development for Medicis Pharmaceutical Corporation ("Medicis"), and have been employed by Medicis since 1997. From 1980 to 1997, I was employed at Neutrogena Corporation, and was the President of the Dermatologics Division starting in 1989.
2. Medicis is a licensee under this patent application.
3. Since 1980 I have been involved in the research and development for numerous dermatological products. My Ph.D. is in cellular and molecular biology from the University of Southern California.
4. I have reviewed the record in this application concerning the differences between dandruff and seborrheic dermatitis. The scientific literature of record correctly

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states the understanding in the fields of dermatology and dermatological research that these are separate and distinct conditions. See, the reference cited previously in the above-identified application and attached as Exhibits A.

5. The rest of the scientific literature is in accord with the view that dandruff is a "noninflammatory" scaling of the scalp, while "seborrheic dermatitis is an inflammatory, erythematous, and scaling eruption that occurs in seborrheic areas...such as the scalp, face, and trunk." (See *Manual of Dermatologic Therapeutics*, Fifth ed., p. 164-167 (1995) attached as Exhibit B).
6. Even the scales of dandruff look different from the scale from seborrheic dermatitis; dandruff has thin, white or gray flakes, while seborrheic dermatitis has oily, yellowish scales with inflammation. (See *Handbook of Nonprescription Drugs*, p. 550-552 (1996) attached as Exhibit C).
7. One of ordinary skill in the art would not find it obvious to use a certain composition to treat seborrheic dermatitis, merely because the same composition is used to treat dandruff.
8. I am unable to respond to the Examiner's position to the contrary. The Examiner has not addressed the substance of the cited literature, and does not appear to speak on the basis of her own research or clinical experience. Without any basis for her rejection of the well-settled understanding of those in the art, I cannot know why she has taken this mistaken position, how to explain the source of her error, or what evidence would convince her that her position is incorrect. The most that one can say is that the Examiner appears to have taken a position on the

basis of her own belief that is contrary to the scientific literature of record and my own long experience in the field.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application and any registration resulting therefrom.

Mitchell S. Wortzman  
Mitchell S. Wortzman, Ph.D.

Date: 6/6/03

Exhibit

A

# CHAPTER 126 - Seborrheic Dermatitis

Gerd Plewig

Thomas Jansen

Seborrheic dermatitis is a common, chronic papulosquamous dermatosis that is usually easily recognized. It affects infants and adults and is often associated with increased sebum production (seborrhea) of the scalp and the sebaceous follicle-rich areas of the face and trunk. The affected skin is pink, edematous, and covered with yellow-brown scales and crusts. The disease has a wide range from mild to severe, including psoriasiform or pityriasisiform patterns and erythroderma.<sup>1,2,3,4,5</sup> Seborrheic dermatitis is one of the most common skin manifestations in patients with HIV infection.<sup>6,7,8,9</sup> It is therefore included in the spectrum of premonitory lesions and should be carefully evaluated in high-risk patients.

## Incidence

Seborrheic dermatitis has two age peaks, one in infancy within the first 3 months of life and the second around the fourth to the seventh decade of life. No data are available on the exact incidence of seborrheic dermatitis in infants, but the disorder is common. The disease in adults is believed to be more common than psoriasis, for example, affecting at least 2 to 5 percent of the population. Men are affected more often than women in all age groups. There does not appear to be any racial predilection. Seborrheic dermatitis is one of the most common diseases associated with HIV infection as it is found in up to 85 percent of these patients.<sup>7</sup>

## Etiology and Pathogenesis

Although many theories abound, the cause of seborrheic dermatitis remains unknown.

## Seborrhea

The disease is associated with oily-looking skin (seborrhea oleosa), although increased sebum production cannot always be detected in these patients.<sup>10</sup> Even if seborrhea does provide a predisposition, seborrheic dermatitis is not a disease of the sebaceous glands. The high incidence of seborrheic dermatitis in newborns parallels the size and activity of the sebaceous glands at this age. It has been shown that newborns have large

sebaceous glands with high sebum secretion rates.<sup>11</sup> In childhood, sebum production and seborrheic dermatitis are closely connected. In adulthood, however, they are not, as the sebaceous gland activity peaks in early puberty and seborrheic dermatitis may not occur until decades later.

The sites of predilection—face, ears, scalp, and upper part of the trunk—are particularly rich in sebaceous follicles. Two diseases are prevalent in these regions: seborrheic dermatitis and acne. In patients with seborrheic dermatitis, the sebaceous glands are often particularly large on cross-sectional histologic specimens. In one study, skin surface lipids were not elevated but the lipid composition was characterized by an increased proportion of cholesterol, triglycerides, and paraffin and a decrease in squalene, free fatty acids, and wax esters.<sup>12</sup> Seborrheic dermatitis seems to be more frequent in patients with parkinsonism, in whom sebum secretion is increased, and after treatment with levodopa and a reduction of skin oiliness, seborrheic dermatitis may be improved.<sup>13</sup>

The synonym *eczéma flannellaire* stems from the idea that a retention of skin surface lipids by clothing—cotton (flannel), wool, or synthetic underwear in particular—promotes or aggravates seborrheic dermatitis.

## **Microbial Effects**

Unna and Sabouraud, who were among the first to describe the disease, favored an etiology involving bacteria, yeasts, or both. This hypothesis has remained unsupported, although bacteria and yeasts can be isolated in great quantities from affected skin sites.

In infancy, *Candida albicans* is often found in dermatitic skin lesions and in stool specimens. Intracutaneous tests with candidin, positive agglutinating antibodies in serum, and positive lymphocyte-transformation tests in affected infants revealed a sensitization to *C. albicans*. Even so, these observations cannot be convincingly linked to the pathogenesis. Aerobic bacteria were recovered from the scalp of patients with seborrheic dermatitis (geometric mean of 140,000/cm<sup>2</sup> versus 280,000 in normal individuals and 250,000 in persons with dandruff). In contrast, *Staphylococcus aureus* was rarely seen in normal persons or those with dandruff. When present, it was recovered in about 20 percent of patients with seborrheic dermatitis, accounting for an average of about 32 percent of the total skin flora.<sup>14</sup>

*Propionibacterium acnes* counts were low in patients with seborrheic dermatitis (7550 geometric mean/cm<sup>2</sup> in those without dandruff). The

small quantities of *P. acnes* in patients with seborrheic dermatitis may explain the low yield of free fatty acids from their skin surfaces.

The lipophilic yeast *Pityrosporum* is abundant in normal skin (504,000 geometric mean/cm<sup>2</sup> versus 922,000 in individuals with dandruff and 665,000 in patients with seborrheic dermatitis).<sup>14</sup> This organism has received particular attention in recent years. Some authors claim strong evidence in favor of a pathogenic role for these microbes,<sup>15,16,17</sup> whereas others do not share this view. Their arguments are that *P. ovale* is not the causative organism but is merely present in large numbers. Clearing of seborrheic dermatitis by selenium sulfide and continued suppression of *P. ovale* with topical amphotericin B caused a relapse of the disease on inflamed scalp skin.<sup>17</sup> In seborrheic dermatitis, both normal<sup>18</sup> and high<sup>19</sup> levels of serum antibodies against *P. ovale* have been demonstrated. A cell-mediated immune response to *P. ovale* has been found in normal individuals using *Pityrosporum* extracts in lymphocyte-transformation studies.<sup>20</sup> Others have demonstrated an association between strong skin colonization with *P. ovale* and altered cellular immunity.<sup>21</sup> Overgrowth of *P. ovale* may lead to inflammation, either through introduction of yeast-derived metabolic products into the epidermis or as a result of the presence of yeast cells on the skin surface. The mechanism of production of inflammation would likely then be through Langerhans cell and T lymphocyte activation by *Pityrosporum* or its byproducts. When *P. ovale* comes into contact with serum, it can activate complement via the direct and alternative pathways, and this may play some part in the introduction of inflammation.<sup>22</sup>

## Miscellaneous

### Drugs

Several drugs have been reported to produce seborrheic dermatitis-like lesions, including arsenic, gold, methyldopa, cimetidine, and neuroleptics.<sup>23</sup>

<sup>24</sup>

### Neurotransmitter abnormalities

Seborrheic dermatitis is often associated with a variety of neurologic abnormalities, pointing to a possible influence of the nervous system.<sup>25,26</sup> These neurologic conditions include postencephalitic parkinsonism, epilepsy, supraorbital injury, facial paralysis, unilateral injury to the ganglion of Gasser, poliomyelitis, syringomyelia, and quadriplegia. Emotional stress seems to aggravate the disease; a high rate of seborrhea is reported among combat troops in times of war.

## **Physical factors**

Seasonal variations in temperature and humidity are related to the course of the disease. Low autumn and winter temperatures and low humidity in centrally heated rooms are known to worsen the condition. Seborrheic dermatitis of the face was observed in 8 percent of 347 patients receiving PUVA therapy for psoriasis and occurred within a few days to 2 weeks after the beginning of treatment<sup>22</sup>; the patients had no previous history of facial psoriasis or seborrheic dermatitis. Lesions were avoided by masking the face during irradiation.

## **Aberrant epidermal proliferation**

Epidermal proliferation is increased in seborrheic dermatitis, like psoriasis, which explains why cytostatic therapeutic modalities may improve the condition.<sup>23</sup>

## **Nutritional Disorders**

Zinc deficiency in patients with acrodermatitis enteropathica and acrodermatitis enteropathica-like conditions may be accompanied by dermatitis mimicking seborrheic dermatitis of the face. Seborrheic dermatitis, however, is not associated with zinc deficiency nor does it respond to supplementary zinc therapy. Seborrheic dermatitis in infancy may have a different pathogenesis. Biotin deficiency, whether secondary to a holocarboxylase deficiency or a biotinidase deficiency, and abnormal metabolism of essential fatty acids<sup>24</sup> have been proposed as possible mechanisms.

## **Immunodeficiency and Seborrheic Dermatitis**

The development of seborrheic dermatitis either de novo or as a flare of preexisting disease may also serve as a due to the presence of HIV infection. The first report of this association in 1984<sup>6</sup> was followed by observations from all parts of the world.<sup>25,26</sup> The expression of the disease differs in several aspects from the classic form seen in HIV-seronegative individuals (Figs. 126-1, 126-2, 126-3, and 126-4). The distribution is extensive, severity remarkable, and treatment often difficult (Fig. 126-5). Even the histologic changes differ somewhat from those seen in commonly encountered seborrheic dermatitis (Table 126-1).<sup>2</sup>

The increased incidence and severity of seborrheic dermatitis in HIV-seropositive individuals has led to speculation that unchecked growth of *Pityrosporum* in immunosuppressed patients is responsible. However,

studies that compared quantitative *Pityrosporum* cultures in AIDS patients with and without seborrheic dermatitis either failed to demonstrate increased yeast colonization in patients with seborrheic dermatitis<sup>30</sup> or yielded only a weak correlation between yeast colonization and seborrheic dermatitis.<sup>31</sup>

## Psoriasis and Seborrheic Dermatitis

In patients with a psoriatic diathesis, particularly adults, seborrheic dermatitis is said to evolve into psoriasis. The term *sebopsoriasis* is sometimes used for these overlapping conditions. It should be used with caution because psoriasis, especially of the scalp, is clinically and histologically almost indistinguishable from seborrheic dermatitis.

## Pityriasis Amiantacea

*Pityriasis amiantacea* (also known as *tinea amiantacea*, *porrigo amiantacea*, *tinea asbestina*, *fausse teigne amiantacée*, *keratosis follicularis amiantacea*) is the name given to a disease of the scalp in which heavy scales extend onto the hairs and separate and bind together their proximal portions (Fig. 126-6).

*Pityriasis amiantacea* is a reaction of the scalp, often without evident cause, that may occur at any age. It may be observed as a complication or sequel of streptococcal infection, seborrheic dermatitis, atopic dermatitis, or lichen simplex and it also occurs in psoriasis, of which it may be the first clinical manifestation.<sup>32,33</sup> The process may be circumscribed or diffuse. It is only slightly inflammatory, with dry, micaceous scales, or markedly inflammatory, with admixture of a crust. Removal of the scales reveals normal or erythematous, edematous epidermis. The process is not followed by atrophy, scarring, or alopecia. If scarring alopecia occurs, it may be related to secondary infection.

A common form complicates chronic or recurrent fissuring behind one or both ears, mostly in young girls, with the sticky scales extending several centimeters into the neighboring scalp. Another form extends upward from patches of lichen simplex and is seen mainly in middle-aged women.

## Histopathology

The histologic picture varies according to the stage of the disease, i.e., acute, subacute, or chronic.<sup>34-36</sup> In acute and subacute seborrheic dermatitis, there is a sparse superficial perivascular infiltrate of lymphocytes and histiocytes, slight to moderate spongiosis, slight psoriasiform

hyperplasia, follicular plugging by orthokeratosis and parakeratosis, and scale-crusts containing neutrophils at the tips of the follicular ostia (see Table 126-1). In chronic seborrheic dermatitis, there are markedly dilated capillaries and venules in the superficial plexus in addition to the above-mentioned features.

Clinically and histologically, the lesions of chronic seborrheic dermatitis are psoriasiform and often difficult to distinguish from those of psoriasis.<sup>34</sup> Abortive forms of psoriasis share many features with seborrheic dermatitis. There are lesions that resemble psoriasis and may persist over many years before they finally turn into overt psoriasis. The most important diagnostic signs of seborrheic dermatitis are mounds of scale-crust containing neutrophils at the tips of the dilated horn-filled follicular infundibula. Acrosyringia and acroinfundibula may be plugged by corneocyte casts.

The most consistent findings in pityriasis amiantacea are spongiosis, parakeratosis, migration of lymphocytes into the epidermis, and a variable degree of acanthosis.<sup>35</sup> The essential feature responsible for the asbestos-like scaling are diffuse hyperkeratosis and parakeratosis together with follicular keratosis surrounding each hair by a sheath of corneocytes and debris.

## Exfoliative Cytology

Cytologic abnormalities of superficial horny cells (corneocytes), including ortho- and parakeratotic (nucleated) cells, horny cells in different stages of nuclear decomposition (halo cells), and masses of leukocytes, can be evaluated by exfoliative cytology. Seborrheic dermatitis and psoriasis, however, present similar findings compared with other conditions of the dermatitis-eczema group.<sup>37</sup>

## Clinical Findings

In all patients with seborrheic dermatitis there is a so-called seborrheic stage, often combined with a gray-white or yellow-red skin discoloration, prominent follicular openings, and mild to severe pityriasisiform scales. Several forms can be distinguished (Table 126-2).

## Seborrheic Dermatitis in Infants

The disease occurs in infants, predominantly within the first months of life, as an inflammatory disease mainly affecting the hairy scalp and intertriginous folds with greasy-looking scales and crusts. Other regions such as the

center of the face, chest, and neck may also be affected. Scalp involvement is fairly characteristic. The frontal and parietal scalp regions are covered with an oily-looking, thick, often fissured crust [*crusta lactea* (*milk crust*), or *cradle cap*]. Hair loss does not occur, and inflammation is sparse. In the course of the disease, the redness increases and the scaled areas form clearly outlined erythematous patches topped by a greasy scale. Extension beyond the frontal hairline occurs. The retroauricular folds, the pinna of the ear, and the neck may also be involved. Otitis externa is often a complicating factor. Semiocclusive clothing and diapers favor moisture, maceration, and intertriginous dermatitis, particularly in the folds of the neck, axillae, anogenital area, and groin. Opportunistic infection with *C. albicans*, *S. aureus*, and other bacteria occurs. The clinical aspect reminds one of psoriasis vulgaris, hence the expressions *psoriasoid psoriasis* or *napkin psoriasis*.<sup>38</sup>

### **Course**

The disease is usually protracted over weeks to months. Exacerbation and, rarely, erythroderma desquamativum may occur. The prognosis is good. There is no indication that infants with seborrheic dermatitis are more likely to suffer from the adult form of the disease.

### **Differential Diagnosis**

The differential diagnosis in seborrheic dermatitis of infancy includes atopic dermatitis (which usually starts after the third month of life); psoriasis in newborns, a rare disease; scabies; and Langerhans cell histiocytosis. The most useful distinguishing feature between atopic dermatitis and seborrheic dermatitis is the increased number of lesions on the forearms and shins in the former and in the axillae in the latter. The development of skin lesions solely in the diaper area favors a diagnosis of infantile seborrheic dermatitis.<sup>39</sup> Radioallergosorbent testing for egg white and milk antibodies or other geographically or ethnically relevant allergens (e.g., soybean) and, to a lesser extent, total IgE levels may be useful in diagnosing atopic dermatitis at an early stage and distinguishing it from infantile seborrheic dermatitis.<sup>40</sup>

### **Erythroderma Desquamativum (Leiner's Disease)**

This complication of seborrheic dermatitis in infants (dermatitis seborrhoides infantum) was described in 1908 by Leiner.<sup>41</sup> There is usually a sudden confluence of lesions leading to a universal scaling redness of the

skin (erythroderma). The young patients are severely ill with anemia, diarrhea, and vomiting. Secondary bacterial infection is common. The disease occurs in both a familial and a nonfamilial form. Patients with the former are noted for having a functional deficiency of C5 complement, resulting in defective opsonization. These patients respond to antibiotics and infusions of fresh-frozen plasma or whole blood.

## **Seborrheic Dermatitis in Adults**

The clinical picture and course of this disease differ in adults and infants.

*Seborrheic eczematid* is the mildest form of the disease (eczematid = eczema-like, dermatitis-like). It is associated with seborrhea, scaling, mild redness, and often pruritus of the scalp, eyebrows, nasolabial folds, and retroauricular area, as well as over the sternum and the shoulder blades (see Figs. 126-1 to 126-4). Asymptomatic, fluffy white dandruff of the scalp represents the mild end of the spectrum of seborrheic dermatitis and has been referred to as *pityriasis sicca*.

*Erythema paranasale*, more common in young women than men, may be part of this disease spectrum.

*Patchy seborrheic dermatitis* is the classic, well-known disease with chronic recurrent lesions. Lesions have a predilection for scalp, temples, retroauricular folds and external ear canals (Fig. 126-3), inner parts of the eyebrows and glabella with nasolabial folds (Fig. 126-2), and V-shaped areas of the chest and back (*eczema mediothoracicum*). Less frequently, intertriginous areas such as the side of the neck, axillae, submammary region, umbilicus, and genitocrural folds are involved. Skin lesions are characterized by a yellow color, mild to severe erythema, mild inflammatory infiltrate, and oily, thick scales and crusts. This has occasionally been referred to as *pityriasis steatoides*. Patients report pruritus, particularly on the scalp and in the ear canal. The lesions start with follicular and perifollicular redness and mounds; they spread until they form clearly outlined, round to circinate (petaloid) patches (Greek *petalon*, a thin plate or leaf). The pityriasisform type of seborrheic dermatitis is seen on the trunk and mimics the lesions of *pityriasis rosea*, producing oval scaly lesions whose long axes tend to parallel the ribs. In some individuals only one or two sites are involved. Chronic otitis externa may be the sole manifestation of seborrheic dermatitis. Another possible manifestation is blepharitis, with honey-colored crusts along the rim of the eyelid and casts of horny cell debris around the eyelashes. In men, a more follicular type of seborrheic

dermatitis may extend over large parts of the back, flanks, and abdomen.

### **Course**

Usually the disease lasts for years to decades with periods of improvement in warmer seasons and periods of exacerbation in the colder months. Widespread lesions may occur as a result of improper topical treatment or sun exposure. The extreme variant of the disease is a generalized exfoliative erythroderma (seborrheic erythroderma).

### **Differential Diagnosis**

The differential diagnosis varies from site to site: *scalp*: dandruff, psoriasis, atopic dermatitis, impetigo; *ear canal*: psoriasis or contact dermatitis, irritant or allergic; *face*: rosacea, contact dermatitis, psoriasis, impetigo; *chest and back*: pityriasis versicolor, pityriasis rosea; *eyelids*: atopic dermatitis, psoriasis, *Demodex folliculorum* infestation (demodicosis, demodicidosis); *intertriginous areas*: psoriasis, candidiasis.

### **Therapy**

In general, therapy is directed toward loosening and removal of scales and crusts, inhibition of yeast colonization, control of secondary infection, and reduction of erythema and itching. Patients should be informed about the chronic nature of the disease and understand that therapy works by controlling the disease rather than by curing it.

### **Infants**

#### **Scalp**

Treatment consists of the following measures: removal of crusts with 3 to 5% salicylic acid in olive oil or a water-soluble base; warm olive oil compresses; application of low-potency glucocorticoids (e.g., 1% hydrocortisone) in a cream or lotion for a few days; mild baby shampoos; proper skin care with emollients, creams, and soft pastes.

#### **Intertriginous Areas**

Treatment measures include drying lotions, such as 0.2 to 0.5% cloquinol in zinc lotion or zinc oil. In cases of candidiasis, nystatin or amphotericin B lotion or cream can be applied followed by soft and stiff pastes. In cases of oozing dermatitis, application of 0.1 to 0.25% gentian violet (solutio pyoctanini) in combination with cotton or muslin diapers is often helpful. Imidazole preparations (e.g., 2% ketoconazole in soft pastes, creams, or

lotions) may also be effective.

## **Adults**

Because the disease runs an unpredictably long course, careful and mild treatment regimens are recommended. Anti-inflammatory agents and, when indicated, antimicrobial or antifungal agents have to be used.

### **Scalp**

Daily shampoo with shampoos containing 1 to 2.5% selenium sulfide, antifungals (e.g., ketoconazole), zinc pyrithione, benzoyl peroxide, salicylic acid, coal or juniper tar, or detergents is recommended. Crusts or scales can be removed by overnight application of glucocorticoids or salicylic acid in water-soluble bases or, when necessary, under occlusive dressings. Tinctures, alcoholic solutions, hair tonics, and similar products usually aggravate the inflammatory state and should be avoided.

### **Face and Trunk**

Patients should avoid greasy ointments and reduce or omit the use of soaps. Alcoholic solutions or pre- or aftershave lotions should not be recommended. Low-potency glucocorticoids (1% hydrocortisone is usually sufficient) are helpful early in the course of the disease; uncontrolled long-term applications will lead to side effects such as steroid dermatitis, steroid rebound phenomenon, steroid rosacea, and perioral dermatitis.

### **Antifungals**

Good results are achieved with topical application of antifungal agents, especially imidazoles. Usually 2% preparations in the form of shampoos and creams are used. Double-blind studies report 75 to 95 percent improvement. In these trials, however, only ketoconazole<sup>42-43-44-45-46</sup> or itraconazole<sup>43</sup> were studied; other imidazoles such as econazole, clotrimazole, miconazole, oxiconazole, isoconazole, and ciclopiroxolamine may also be effective. Allylamine antifungals such as terbinafine solution (1%) may also be effective.<sup>47</sup> Comparative studies are lacking. The authors' personal experience, though based on open, uncontrolled studies only, is best with ketoconazole cream. Imidazoles, like other antifungal agents, have a wide spectrum of effects, including anti-inflammatory properties and inhibition of cell wall lipid synthesis.<sup>48</sup> Their efficacy is not proof of a causal relationship between *P. ovale* and seborrheic dermatitis.

## **Metronidazole**

Topical metronidazole is a worthwhile alternative in the treatment repertoire of seborrheic dermatitis. It has made its successful debut in patients with rosacea. Extemporaneous formulations (up to 2% in a cream base) or commercial products (0.75% gel, MetroGel) are used once or twice daily. There are no formal studies, and the drug is registered for the treatment of rosacea only. This recommendation is based on the authors' experience.

## **Seborrheic Otitis Externa**

Seborrheic otitis externa can be best treated with a low-potency glucocorticoid cream. Many otic preparations (solutions) contain neomycin, which is a strong sensitizer, and should therefore be avoided. Once dermatitis is under control, the glucocorticoid should be discontinued and a solution containing aluminum acetate be applied once or twice daily to maintain control. This acts as a drying agent and reduces the microbial flora.

## **Seborrheic Blepharitis**

Special consideration is given to the treatment of seborrheic blepharitis. The use of hot compresses with gentle debridement with a cotton-tipped applicator and baby shampoo one or more times daily is recommended. Stubborn cases may require the use of a topical antibiotic such as sodium sulfacetamide ophthalmic ointment. The possible use of ocular preparations containing glucocorticoids should be referred to an ophthalmologist.

## **Pityriasis Amiantacea**

The scales should be removed by the use of cade oil (juniper tar) ointment or a topical tar/salicylic ointment. Either preparation should be washed out of the scalp after 4 to 6 h with a suitable shampoo, e.g., tar or imidazole shampoo. Potent topical glucocorticoid scalp creams or liquids may be beneficial in some cases, preferably under plastic occlusion in the initial phase. A vitamin D analogue (calcipotriol cream or lotion, or tacalcitol ointment) is also recommended and useful in selected patients. If topical treatment fails, systemic glucocorticoids (e.g., 0.5 mg prednisolone per kg body weight daily for about 1 week) in combination with topical treatment (steroid under occlusion, followed by open application) is worthwhile. Concomitant antimicrobial treatment (e.g., macrolides, sulfonamides) is reserved for stubborn cases, especially if bacterial coinfection of the scalp is

treatment of tinea pedis can help to prevent the development of a life-threatening cellulitis. Intertrigo needs to be prevented as it can be a portal of entry for irritants and infectious agents. Prevention of venous ulcers and of allergic contact dermatitis needs to be meticulous in patients with gravitational eczema who are dangerously prone to both of these complications. Elderly skin is more prone to traumatic lacerations. Aged skin which is edematous is particularly susceptible to trauma and bulla formation.

### **Skin Atrophy**

Skin atrophy can be compounded due to a poor understanding of the correct use of medications, leading to misuse of topical steroids in the elderly patient, who may have associated edema with vascular insufficiency. The geriatric dermal-epidermal interface is already compromised. The fragile skin of the poorly groomed foot is a setup for fissures, bullae, infection, and further loss of the ability to be mobile.

### **Seborrheic Dermatitis**

(See Chap. 126)

Although seborrheic dermatitis can affect all ages and both males and females, it becomes much more common with increasing age. The association with increasing age correlates best in men, whereas women have a peak in morbidity after puberty, after which it gradually declines. There appears to be a cephalocaudad progression of the location with increasing age. Although the face and head are the predominant sites in younger age groups and certainly can be severely affected in the elderly, genitocrural and lower extremity lesions increase with age. The pubis, crural folds, gluteal cleft, and penis (seborrheic balanitis) may be involved. Lesions may be misdiagnosed as tinea infections. Striking flares of seborrheic dermatitis have been associated with confining illnesses such as coronary infarction. Exacerbations may eventuate in a diffuse erythroderma, which is often misdiagnosed. Pathogenesis may be related to changes in the cutaneous microflora. A neurophysiologic role is suggested by the association of seborrheic dermatitis with mental retardation and with Parkinson's disease. Seborrheic dermatitis may appear abruptly in the elderly, heralding the onset of Parkinson's disease. The scalp is usually involved, often giving rise to a mistaken diagnosis of dandruff. Simple dandruff declines late in adult life.

## Intertrigo

Intertrigo is more frequent in the elderly due to redundant skin folds and environmental factors, including temperature, moisture, friction, and inadequate hygiene. Polymicrobial secondary colonization and subsequent infection can occur. No one organism can be singled out as the main agent.

## Treatment of the Cutaneous Signs of Aging

Multiple medical and surgical therapeutic modalities are evolving for the treatment of the outward signs of intrinsic aging and photoaging. See Table 146-3.

Some publications still use the obsolete term *premature skin aging* to describe alterations in unprotected skin, notably the face and sun-exposed areas, implying that this is merely exaggerated manifestations of normal aging. However, the evidence is convincing that photoaging is not simply an acceleration of the inevitable age-dependent alterations. Photoaging denotes the gross and microscopic cutaneous changes that are a consequence of chronic solar radiation. Recent studies demonstrate that this spectrum of changes is often diametrically opposed to that which occurs in intrinsically aged skin.<sup>44-45</sup> Sun worshippers do look prematurely aged, and this is the basis for the common misconception. Those who scrupulously avoid the sun can reach the ninth decade with smooth, unblemished skin that shows only mild thinning, loss of elasticity, and a deepening of normal expression lines. By contrast, at age 50, serious sun worshippers, especially those of skin phototype I (blue-eyed, fair-skinned, Celtic ancestry who burn easily and tan poorly), have a plethora of wrinkles, with yellowed, lax, dry, leathery, knobby, blotchy skin and a variety of benign, premalignant, and malignant neoplasms.

Late nineteenth century dermatologists, notably Unna and Dubreuilh, clearly recognized the baleful influence of sunlight by comparing the integument of farmers and sailors to that of indoor workers. This was at a time when the leisured class stayed out of the sun. Today, a tan is prized by Caucasians and is ironically equated with health and beauty. Because decades of extensive sun bathing can occur before the photoaging changes become apparent to the naked eye,<sup>12</sup> there is a lack of urgency concerning prevention. This latent period also reinforces the impressions that actinically damaged skin differs only quantitatively from intrinsic aging. However, photoaging has distinctive and unique features that are quite different from normal aging.

Exhibit

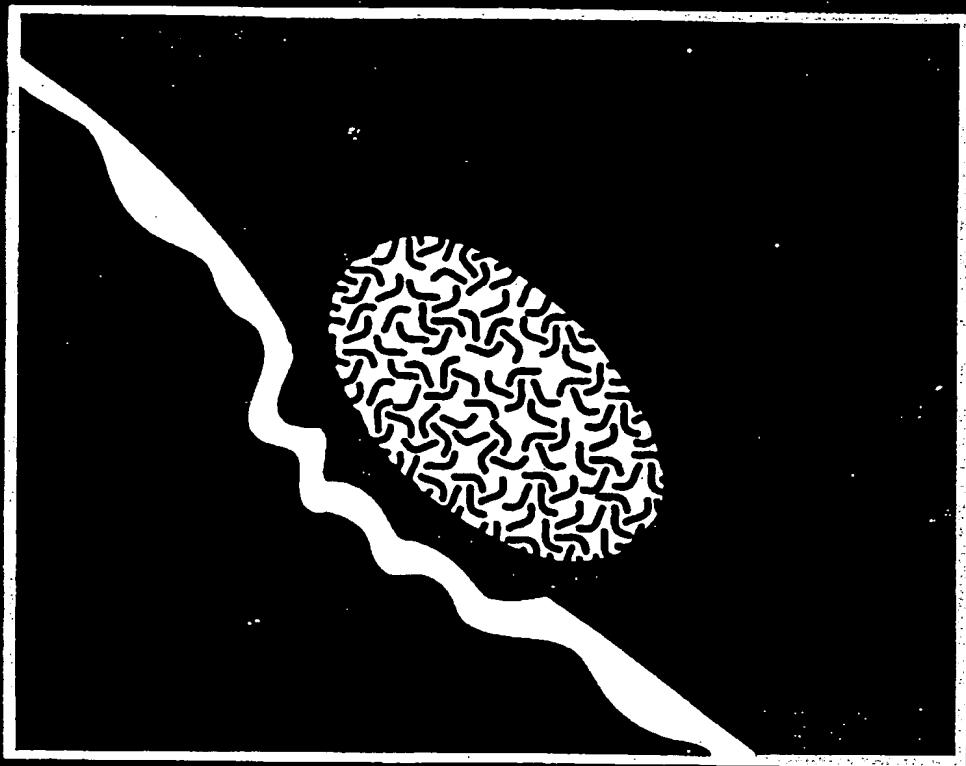
B

**Manual of  
Dermatologic  
Therapeutics**

Fifth Edition

A Little, Brown  
  
Manual

**Kenneth A. Arndt**



# 29

## Seborrheic Dermatitis and Dandruff

the borders may be well defined. Mild erythema and fine, dry scaling also may be found on the eyebrows, eyelids, nasolabial and postauricular folds, moustache, beard, and presternal areas. Infraauricular folds, groin, gluteal crease, and umbilicus are also affected. Lesions may become thick, semiconfluent, yellow, and greasy. Secondary impetiginization and folliculitis may occur. Seborrheic dermatitis may be a cause of a generalized exfoliative erythroderma.

C. Seborrheic marginal blepharitis, which consists of erythema and scaling of eyelid margins and cilia, is often associated with mild granular conjunctivitis. Seborrheic dermatitis in other sites is often not present.

D. Infantile seborrheic dermatitis is characterized by erythema and scaling plaques involving the scalp, diaper region, or flexural surfaces; when the vertex of the scalp is involved, the condition is known as **cradle cap**. Generalized exfoliative dermatitis in an infant secondary to seborrheic dermatitis is referred to as **Leiner's syndrome** with or without a defect in the fifth component of complement.

E. Drug eruptions from gold therapy may mimic seborrheic dermatitis, as may a vitamin E-deficient diet.

### IV. Therapy

A. Agents effective in eliminating the scaling of dandruff and seborrheic dermatitis appear to act by varying mechanisms. Selenium sulfide (see Chap. 40, Cleansing Agents, sec. I,F,2) and tars (see Chap. 40, Keratolytic, Cytorbic, and Destructive Agents, sec. XVI) inhibit mitotic activity, and selenium kills yeasts as well. Zinc pyrithione (see Chap. 40, Cleansing Agents, and sec. I,F,3) is directly cytorbic and has antimicrobial effects, and salicylic acid (see Chap. 40, Keratolytic, Cytorbic, and Destructive Agents, sec. XIV) disrupts the bonds that cause stratum corneum cells to stick together. There are no studies comparing the efficacies of antisborrheic shampoos. The following agents are listed in rough approximation of usefulness:

1. **Ketoconazole** (Nizoral) shampoo is used at least twice weekly.
2. Shampoo containing 2½% **selenium sulfide** (Selisun) should be applied 2-3 times weekly for 5-10 minutes each time.
3. Preparations containing 1-2% **zinc pyrithione** (Danex, DHS-Zinc, Head and Shoulders, Zincom) work almost as well.
4. **Salicylic acid-sulfur shampoos** (Ionil, Sebuler) are less effective but show definite activity.
5. Tar shampoo (DHS-T, Ionil T, Pentrax, Sebutone, T/Gel, Zetar) inhibit epidermal proliferation through cytostatic effects after an initial burst of transient hyperplasia.
6. **Chlorotrine** (Capitrol) shampoo contains a synthetic antibacterial compound similar to the hydroxyguinoline compounds used in dermatology for many years. Comparative efficacy studies with this shampoo are unavailable.
7. Any nonmedicinal shampoo, particularly those containing surfactants and detergents, will remove scales and lead to subjective clinical improvement and decreased desquamation for about 4 days. These agents should be used every 2 days to control dandruff.

B. If the lesions are extensive or very inflammatory, also have the patient apply either a topical corticosteroid solution, lotion, or spray. (Valisone or Diprosone lotion is generally effective; Synalar or Liderex solution and other corticosteroid lotions are also useful.) Alternatively, a 10% sodium sulfacetamide lotion bid-tid may be used.

I. **Definition and pathophysiology.** Seborrheic dermatitis and dandruff may each cause a scaling on the scalp that is often associated with itching. There are, however, distinctions that can be found between the two disorders. Dandruff is noninflammatory, increased scaling on the scalp that represents the more active end of the spectrum of physiologic desquamation. On a normal scalp, approximately 487,000 cells/sq cm can be found after a detergent scrub; scalps affected with dandruff and seborrheic dermatitis liberate up to 800,000 cells/sq cm.

Seborrheic dermatitis is an inflammatory, erythematous, and scaling eruption that occurs primarily in "seborrheic" areas, i.e., those with a high number and activity of sebaceous glands such as the scalp, face, and trunk. Although seborrheic dermatitis occurs in neonatal and postpubertal life—times during which sebaceous glands are most active—no direct relationship between the amount or composition of sebum and the presence of dermatitis has been documented. Patients produce no more sebum on their scalps than do controls, and reducing sebum excretion affects neither dandruff nor seborrheic dermatitis. This disease is one of accelerated epidermal growth resulting in retention of nuclei in stratum corneum cells that have not had sufficient time to completely mature. On a normal scalp there are approximately 3700 nucleated cells/sq cm; on scalps with dandruff there are 25,000, and on those with seborrheic dermatitis the count is 76,000. Follicular occlusion may be a primary event, with yeast overgrowth in the follicles associated with seborrheic dermatitis.

It has been postulated that prolonged retention of sebum on the skin may in some way act as an irritant or alter epidermal function following its percutaneous reentry. *Pityrosporum ovale*, a lipophilic yeast which is a normal inhabitant of the skin, has been hypothesized to be the etiologic agent in seborrheic dermatitis. There is a significantly increased incidence—and often particular severity—of seborrheic dermatitis in patients with AIDS (Grossier, 1989; Marino, 1991). More direct support comes from reports that seborrheic dermatitis responds to oral and topical ketoconazole, an imidazole effective against *Pityrosporum* (see sec. IV,F). No evidence of immediate or delayed hypersensitivity reactions to *P. ovale* has been demonstrated in seborrheic dermatitis. Higher than normal total serum IgG or IgA level has been found in some patients. Often noted and equally intriguing is the increased incidence of seborrheic dermatitis in Parkinson's disease (idiopathic and drug-induced) and other neurologic disorders; one study demonstrated improvement in 10 patients with the use of isotretinoin, implicating an increase in the residual sebum pool due to immobility. *P. ovale* has been cultured in 73% of infants with seborrheic dermatitis; the yeast may be cultured from the scalp, face, and presternal or inguinal region.

II. **Subjective data.** The lesions of seborrheic dermatitis and dandruff are often asymptomatic, but pruritus is not uncommon and may be intense at times.

### III. Objective data

A. Dandruff appears simply as noninflammatory, diffuse scaling on the scalp only.

B. With seborrheic dermatitis, there is erythema, scaling, and at times exudation;

C. **Ketoconazole (Nizoral)**, an imidazole with action against *P. ovale*, has been reported effective for seborrheic dermatitis when given either orally (200 mg PO daily), topically (2% cream applied bid), or as a 2% shampoo. Topical ketoconazole has been studied in children and shown to be effective and well tolerated. Its efficacy is approximately equivalent to that of 1% hydrocortisone cream. Oral ketoconazole has too many potential adverse reactions to warrant its use in this condition.

D. Thick crusts may be removed more easily by overnight applications of a keratolytic gel, with or without plastic cap occlusion; 3% sulfur, 3% salicylic acid, 4% cetyl alcohol—coal tar distillate (Prermatar) cream; Baker's P&S liquid; 20-10-5 ointment (see Chap. 27, sec. V.B.6) or a 30-minute compress with warm mineral oil prior to shampooing.

E. Seborrheic dermatitis lesions on other areas respond rapidly to a corticosteroid cream such as 1% hydrocortisone applied 1-3 times a day. Aerosols or lotions are easier to apply to hairy areas. Prolonged application of high-potency flurinated corticosteroids may lead to disfiguring telangiectasia and atrophy. Other useful topical agents for glabrous skin include sulfur-containing medications such as 10% sulfacetamide lotion; 3% sulfur, 3% salicylic acid, 4% cetyl alcohol—coal tar distillate (Prermatar) cream; or formulations such as precipitated sulfur 3-10%, salicylic acid 1-5%, and tar 2% in an ointment base or 1-3% sulfur in calamine lotion.

F. Seborrheic blepharitis is treated 1-3 times a day with either sulfacetamide alone or a 10% sulfacetamide, 0.2% prednisolone, 0.12% phenylephrine suspension (Blephamide, Vacecidin) or similar preparations (Catared, Metimyd, Optimyd). It is essential to monitor intraocular tension concurrent with intermittent or chronic steroid therapy in or around the eye.

G. Topical lithium succinate ointment used daily for 8 weeks showed remission or marked improvement compared with placebo in 30 patients with seborrheic dermatitis; it is presumed to act as an anti-inflammatory agent.

H. A 15% propylene glycol solution applied to the scalp reduced the number of *P. ovale* and improved seborrheic dermatitis in 90% of those treated.

I. Ultraviolet light (both UVA and UVB) are inhibitory to the growth of *P. ovale*. Many individuals note improvement of seborrheic dermatitis during the summer months.

#### References

- Berghorst, I. M., et al. An immunological study in patients with seborrheic dermatitis. *Clin. Exp. Dermatol.* 16:331-338, 1991.
- Bindler, R. L., and Jonelis, F. J. Seborrheic dermatitis in neuroleptic-induced paroxysm. *Arch. Dermatol.* 119:473-475, 1983.
- Burton, J. L., and Pye, R. J. Seborrhea is not a feature of seborrheic dermatitis. *Br. Med. J.* 286:1169-1170, 1983.
- Cowley, N. C., Farr, P. M., and Shuster, S. The pernicious effect of sebum in seborrheic dermatitis: An explanation of the rash in neurological disorders. *Br. J. Dermatol.* 122:71-76, 1990.
- Cuelenaere, C., de Berasque, J., and Kint, A. Use of topical lithium succinate in the treatment of seborrheic dermatitis. *Dermatology* 18:194-197, 1992.
- Faergemann, J. Treatment of seborrheic dermatitis of the scalp with ketoconazole shampoo: A double-blind study. *Acta Derm. Venereol. (Stockh.)* 70:111-112, 1990.
- Faergemann, J. Propylene glycol in the treatment of seborrheic dermatitis of the scalp: A double-blind study. *Cutis* 42:69-71, 1988.

Groisser, D., Bottone, E. J., and Lebwohl, M. Association of *Pityrosporum ovale* (*Malassezia furfur*) with seborrheic dermatitis in patients with acquired immunodeficiency syndrome (AIDS). *J. Am. Acad. Dermatol.* 20:770-773, 1989.

Hill, M. K., et al. Skin surface electron microscopy in *Pityrosporum folliculitis*: The role of follicular occlusion in disease and the response to oral ketoconazole. *Arch. Dermatol.* 126:181-184, 1990.

Kieffer, M., et al. Immune reactions to *Pityrosporum ovale* in adult patients with atopic and seborrheic dermatitis. *J. Am. Acad. Dermatol.* 22:739-742, 1990.

Marino, C. T., McDonald, E., and Romano, J. F. Seborrheic dermatitis in acquired immunodeficiency syndrome. *Cutis* 48:217-218, 1991.

Marks, R., Pearce, A. D., and Walker, A. P. The effects of a shampoo containing zinc pyrithione on the control of dandruff. *Br. J. Dermatol.* 112:415-422, 1985.

McGrath, J., and Murphy, G. M. The control of seborrheic dermatitis and dandruff by antipityrosporal drugs. *Drugs* 41:178-184, 1991.

Priestly, G. C., and Brown, J. C. Acute toxicity of zinc pyrithione to human skin cells in vitro. *Acta Derm. Venereol. (Stockh.)* 60:145-148, 1980.

Ruiz-Maldonado, R., et al. *Pityrosporum ovale* in infantile seborrheic dermatitis. *Pediatr. Dermatol.* 6:18-20, 1989.

Shuster, S. The aetiology of dandruff and the mode of action of therapeutic agents. *Br. J. Dermatol.* 111:235-242, 1984.

Skinner, R. B., et al. Double-blind treatment of seborrheic dermatitis with 2% ketoconazole cream. *J. Am. Acad. Dermatol.* 12:852-856, 1985.

Wikler, J. R., et al. The effect of UV-light on *Pityrosporum yeasts*: Ultrastructural changes and inhibition of growth. *Acta Derm. Venereol. (Stockh.)* 70:69-71, 1990.

Exhibit

C

*Handbook of*  
**Nonprescription**  
*Drugs*

Published by  
**American Pharmaceutical Association**  
The National Professional Society of Pharmacists  
2215 Constitution Avenue, NW  
Washington, DC 20037



**Similarities and differences of dandruff, seborrhea, and psoriasis**

	Dandruff	Seborrhea	Psoriasis
Location	Scalp	Adults and children: head and trunk Children only: back, intertriginous areas	Scalp, elbows, knees, trunk, and lower extremities
Exacerbating factors	Generally a stable condition, exacerbated by inadequate washing, dry climate	Exacerbated by many external factors, notably stress and low relative humidity	Exacerbated by mechanical irritation, stress, climate, drugs, infection, endocrine factors
Appearance	Thin, white, or grayish flakes; even distribution on scalp	Patchy lesions with margins; mild inflammation; oily, yellowish scales	Usually symmetrical, red, patchy plaques with sharp border; silvery-white scale; small bleeding points when removed. Difficult to distinguish from seborrhea in early stages or in intertriginous zones
Inflammation	Absent	Present	Present
Epidermal hyperplasia	Absent	Present	Present
Epidermal kinetics	Turnover rate is two times faster than normal	Turnover rate is about five to six times faster than normal	Turnover rate is about five to six times faster than normal
Percentage of incompletely keratinized cells	Rarely exceeds 5% of total corneocyte count	Commonly makes up 15–25% of corneocyte count	Commonly makes up 40–60% of corneocyte count

Information extracted from:

Wright DE. In: Clark C, ed. *Self-Medication: A Reference for Health Professionals*. 3rd ed. Ottawa: Canadian Pharmaceutical Association; 1988: 87.

McGinley KJ et al. *J Invest Dermatol*. 1969; 53: 107.

Kligman AM et al. *J Soc Cosmet Chem*. 1974; 25: 73.

does the number of incompletely keratinized cells, a situation characterized by the retention of nuclei in keratin layer cells. Incompletely keratinized cells in dandruff appear in clusters, possibly as a result of tiny inflammatory foci that are incited when capillaries discharge a load of inflammatory cells into the epidermis, causing accelerated epidermal growth in a small area. These microfoci are found on all scalps but are increased proportionately in dandruff.<sup>7</sup>

The specific cause of accelerated cell growth seen in dandruff is unknown. There is continuing debate over whether dandruff is a result of elevated microorganism levels—particularly of the yeast *Pityrosporum ovale*.<sup>30</sup>

**Treatment** Dandruff is more of a cosmetic than a medical problem, and treatment is fairly straightforward. The patient needs to understand that there is no direct cure for dandruff and that the condition can usually be well

controlled. Washing the hair and scalp with a nonmedicated shampoo every other day or even daily is often sufficient to control dandruff. If it is not, medicated nonprescription antidandruff products may be recommended. With medicated shampoos, contact time improves effectiveness. The patient should be counseled to allow medicated shampoo to remain on the hair for approximately 1 minute before rinsing and repeating. Thorough rinsing is important in the use of all shampoo products.

A cytostatic agent such as pyrithione zinc, selenium sulfide, or coal tar is recommended. These agents reduce the epidermal turnover rate. However, the coal tar-containing shampoos may tend to discolor light hair as well as clothing and jewelry and thus may not appeal to some patients. Next, a keratolytic shampoo containing salicylic acid or sulfur may be used. If dandruff proves resistant to these agents, the patient should be referred to a physician for treatment.<sup>29,31</sup>

should be avoided in intertriginous areas because of their maceration potential. Also, in an acute process, ointments may cause further irritation because of their occlusive effect.

- Aerosols, gels, or lotions may be recommended when the dermatitis affects a hair-covered area of the body.

A large number of cosmetic dry skin formulations are commercially available. These may contain natural oils, vitamins, or a variety of fragrances that have a psychologic appeal. However, the fragrances and dyes found in many of these formulations may be irritating or allergenic to sensitive dry skin and should be avoided.

Efficacy of any skin care product may need to be sacrificed or compromised somewhat to achieve patient acceptance. The most efficacious product that the patient will accept should be recommended.

Topical nonprescription products come in various package sizes and strengths. Table 3 lists the amount of drug needed to cover a given area of the body three times daily over a 1-week period. By being aware of such details, the pharmacist can serve the patient economically as well as therapeutically.

## Scaly Dermatoses

Dandruff, seborrheic dermatitis (seborrhea), and psoriasis are described as chronic, scaly dermatoses. They may be placed on a spectrum ranging from dandruff, a minor problem that is primarily cosmetic, to psoriasis, a clinical condition that can have significant physical, psychologic, and economic consequences. (See Table 4 for the distinguishing features of these three dermatoses.)

Part of the body	Cream/ointment (g)	Lotion/solution/gel (mL)
Face	5–10	100–120
Both hands	25–50	200–240
Scalp	50–100	200–240
Both arms or both legs	100–200	240–360
Trunk	200	360–480
Groin and genitalia	15–25	120–180

Adapted from Bingham EA. Topical dermatologic therapy. In: Rook A, Parish LC, Beare JM, eds. *Practical Management of the Dermatologic Patient*. Philadelphia: JB Lippincott; 1986: 227–8.

Nonprescription products are appropriate for all degrees of dandruff. Many cases of seborrheic dermatitis will respond to the same nonprescription drug regimen used to treat dandruff. Psoriasis that involves mild inflammation may be responsive to nonprescription treatment. However, initial diagnosis and management of acute flare-ups require the attention of a physician.<sup>29</sup>

## Specific Conditions

### Dandruff

Dandruff is a chronic, noninflammatory scalp condition that results in excessive scaling of scalp epidermis. Dandruff is clinically visible in approximately 20% of the population. Severity declines in the summer and is not proved to be aggravated by emotional states. Authorities disagree over whether inadequate shampooing exacerbates dandruff; however, there is agreement that a consistent washing routine is important in managing the condition.<sup>29,30</sup>

**Etiology and Characteristics** Dandruff is not a true disease; rather, it is a physiologic event and condition much like the growth of hair and nails, except that the end product is visible on the scalp and has a substantial cosmetic and social stigma associated with its presence. It correlates with the proliferative activity of the epidermis. Dandruff generally appears at puberty, reaches a peak in early adulthood, levels off in middle age, and declines in advancing years (occurring only rarely after age 75).

Dandruff is characterized by accelerated epidermal cell turnover, an irregular keratin breakup pattern, and the shedding of cells in large scales. It is normal for epidermal cells on the scalp to continually slough off just as they do on other parts of the body. It is also normal for the epidermal cell turnover rate to be greater on the scalp than on other parts of the body. In dandruff patients, however, the epidermal cell turnover rate on the scalp is about twice that of normal scalp.<sup>7</sup> This rate also assists in distinguishing dandruff from seborrhea and psoriasis; psoriasis has a higher rate than seborrhea, which has a higher rate than dandruff.

Dandruff is diffuse rather than patchy; it is not inflammatory; and pruritus is common. Scaling, the only visible manifestation of dandruff, is the result of an increased rate of horny substance production on the scalp and the sloughing of large scales. Dandruff scales often appear around a hair shaft because of the epithelial growth at the base of the hair. This phenomenon does not occur on the normal scalp because the horny substance breaks up in a much more uniform fashion. The horny layer of the scalp normally consists of 25–35 fully keratinized, closely coherent cells per square millimeter arranged in an orderly fashion. However, in dandruff, the intact horny layer has fewer than 10 normal cells per square millimeter, and nonkeratinized cells are common. With dandruff, crevices occur deep in the stratum corneum, resulting in cracking, which generates relatively large scales. If the large scales are broken down to smaller units, the dandruff becomes less visible.

As the rate of keratin cell turnover increases, so too

### Seborrheic Dermatitis

*Seborrheic dermatitis* is a general term for a group of eruptions that occur predominantly in the areas of greatest sebaceous gland activity (eg, the scalp, face, and trunk). This condition affects approximately 12 million Americans. Seborrhea occurs mostly in middle-aged and elderly persons, particularly men. It is often found in persons with parkinsonism, endocrine states associated with obesity, zinc deficiency, and human immunodeficiency virus infection. Quadriplegics and persons who have experienced a cerebrovascular accident (stroke) or a myocardial infarct (heart attack) also seem prone to seborrhea. Because nonprescription therapy is effective in a significant percentage of cases, the pharmacist can play a key role in the management of seborrhea.<sup>32</sup>

**Etiology and Characteristics** Seborrhea is marked by accelerated epidermal proliferation and sebaceous gland activity.<sup>19</sup> The distinctive characteristics of the disorder are its common occurrence in hairy areas (especially the scalp); the appearance of dull, yellowish-red lesions, which are well demarcated; and the associated presence of oily-appearing, yellowish scales. Pruritus is common.<sup>33</sup> The most common form, seborrhea of the scalp, is characterized by greasy scales on the scalp that often extend to the middle third of the face with subsequent eye involvement. (See color plates, photograph 10.) Lesions may also appear in the external auditory canal and around the ear. When seborrhea of the scalp occurs in newborns and infants, it is referred to as cradle cap and is treated primarily by gentle massaging with baby oil followed by a nonmedicated shampoo to remove the scales. Pruritus does not appear to accompany cradle cap, and the condition often clears spontaneously by 8–12 months of age.<sup>11,29,32</sup>

The cause of seborrhea is unknown although predisposition appears to be a genetic trait. Emotional and physical stress serve as aggravating factors. Proposed etiologic factors have included vitamin B complex deficiency, food allergies, autoimmunity, climate changes, and low relative humidity. The characteristic accelerated cell turnover and enhanced sebaceous gland activity give rise to the prominent scale displayed in the condition; however, there is no clear-cut quantitative relationship between the degree of sebaceous gland activity and susceptibility to seborrhea.

It is almost universally accepted that seborrhea is merely an extension of dandruff, and the controversy regarding the involvement of *P. ovale* extends to seborrhea. Some researchers, however, dispute the link with dandruff, offering evidence that seborrhea is a separate condition. Incompletely keratinized cells commonly make up 15–25% of the corneocyte count in seborrheic dermatitis but rarely exceed 5% in dandruff.<sup>7,32</sup>

**Assessment** The differential assessment of seborrheic dermatitis is usually straightforward. However, whereas dandruff is considered a relatively stable condition, seborrhea fluctuates in severity, often as a result of stress. Involvement of eyebrows and eyelashes, with concurrent blepharitis, is associated with seborrhea but not with dandruff. Moreover, dandruff is considered a noninflammatory condition whereas seborrhea is usually accompanied by erythema and sometimes crusting.

Lesion distribution is a key factor in distinguishing seborrhea from psoriasis. Seborrhea commonly involves the face and generally is not found on the extremities, whereas psoriasis is rarely found on the face but is commonly found on bony prominence such as the elbows and knees. However, the scalp is generally involved in both conditions, and if this is the only site of involvement, differential assessment is difficult. Physical appearance of scales may help to differentiate the two disorders. Seborrhea is usually marked by oily, yellow scales whereas psoriatic scales are generally dry and silvery in appearance. Additionally, the presence of the Auspitz sign (small bleeding points) is indicative of psoriasis.

Fungal infections may be mistaken for seborrhea. Thus, proper assessment is important because fungal infections may be worsened by seborrhea therapy using hydrocortisone. If the lesion is located in the groin, tinea cruris (jock itch) must be considered, especially during warm weather. Scalp lesions must be evaluated for the possibility of tinea capitis (ringworm of the scalp).<sup>7</sup>

**Treatment** The treatment of seborrheic dermatitis is similar to that of dandruff. Seborrhea generally responds to shampoos containing pyrithione zinc, selenium sulfide, salicylic acid, or coal tar. However, frequent use of selenium sulfide may make the scalp oily and may actually exacerbate the seborrheic condition.

A primary difference between the treatment of dandruff and that of seborrhea is the use of topical corticosteroids. These products are not indicated for dandruff but may be used in the management of seborrheic dermatitis whenever erythema is persistent after therapy with medicated shampoos. Hydrocortisone lotions for scalp dermatitis are available without a prescription. The patient should be instructed to apply the hydrocortisone product two to three times a day until symptoms subside and then intermittently to control acute exacerbations. The patient should also be instructed in the proper technique of application. The hair should be parted and the product applied directly to the scalp and massaged in thoroughly. This process should be repeated until desired coverage of the affected area is achieved. The absorption of medication into the scalp is enhanced if the lotion is applied after shampooing; skin hydration promotes drug absorption.

The patient should be encouraged to minimize prolonged and continued use of hydrocortisone in the treatment of seborrheic dermatitis because a rebound flare may occur when prolonged therapy is discontinued. If the condition worsens or if symptoms persist for more than 7 days, a physician should be consulted. At this point, a more potent topical steroid may be indicated.<sup>7</sup>

If the seborrhea spreads to the ear canal, eyelashes, or eyelids, a physician should be consulted for appropriate therapy. This may include the use of prescription otic and ophthalmic agents.

Nonprescription products used to treat seborrhea are to be avoided for children under 2 years of age, except under the advice and supervision of a physician.<sup>34</sup>

### Psoriasis

Psoriasis is estimated to afflict 1–3% of the US population. Lesions are often localized but may become gener-